SPR – Part II
FY 2007 Research Work Program

RESEARCH AND TECHNOLOGY

PREPARED FOR THE
RHODE ISLAND DEPARTMENT OF TRANSPORTATION
BY THE
RESEARCH AND TECHNOLOGY SECTION

JAMES R. CAPALDI, P.E., DIRECTOR
EDMUND T. PARKER, JR., P.E., CHIEF ENGINEER
COLIN A. FRANCO, P.E., MANAGING ENGINEER

Table of Contents

Task: SPR-2(29) 2200

I. Introduction

- The Research and Technology (R&T) section is part of the Transportation Development division of the Rhode Island Department of Transportation. One of the four primary functions of R&T is the responsibility to administer and execute the research program of the RIDOT.

- The research program is funded with State Planning and Research monies. Federal funds from Appropriation Code 086, "Mandatory 25% Research, Development and Technology Transfer Activities" are utilized under Federal-Aid Project SPR-2(29). The program will be executed according to guidelines under the Mandate of 23 CFR Research Manual.

Organization of Research Effort

- *Research and Technology Development Organization:* In accordance with our organization chart the Research Unit under M. Sock performs duties with administrative guidance from F. Manning and D. Munroe (see page 29 for the R&T organization chart).

- *Research Manual:* The RIDOT research effort is operated in accordance with the guidelines set forth in the RIDOT Research Manual.

- *R.I.D.O.T. Research Advisory Committee (RRAC):* The RRAC was formed shortly after the research responsibility was handed over to the R&T section in July, 1993. Its members are made up from the main divisions of RIDOT and from the FHWA.

    - The committee is charged with assisting R&T in determining research needs and issues that require study. The committee will also solicit problem statements and review and assist in prioritizing the same.

    - Technical monitors for research projects funded directly by RIDOT and through New England Transportation Consortium (NETC) will be nominated by the RRAC to ensure flow of the research program.

- *Joint Research Advisory Committee (JRAC):* The JRAC was initiated by the Director of Transportation to facilitate greater cooperation between the state university (URI) and RIDOT by working within the framework of a memorandum of understanding (MoU) to determine the necessity and priority of research programs to be carried out through the Joint Transportation Research Program. The functions of this program are: To conduct basic studies of materials used in transportation; to facilitate economical design, construction, and maintenance of state transportation facilities; and to investigate traffic engineering, transportation planning, safety, and other related items as desired and agreed upon. The MoU is currently being revised, with the intent to renegotiate the agreement with URI.

- *Membership in Other Organizations*: The R&T Managing Engineer is a member of the following organizations: National Cooperative Highway Research Program (NCHRP), New England Transportation Consortium (NETC), Transportation Research Board (TRB), National Transportation Product Evaluation Program (NTPEP), American Association of State Highway and Testing Officials (AASHTO) Standing Committee on Research (SCOR), AASHTO Sub Committee on Materials (S.O.M), AASHTO Region 1 Research Advisory Committee (RAC), and actively participates in the same. R&T is also represented in Northeastern Paint Coatings (NEPCOAT), Pavement Preservation E.T.G.

- Several members of the R&T staff participate in technical panels for NCHRP.

- Future research projects and studies will be aligned thematically. That is, an attempt will be made to categorize research and examine issues comprehensively. While it is not practical for RIDOT to fund projects on a scale that will encompass all aspects of an issue, several projects working at a problem from different angles may yield a complete picture and do so more cost effectively. These themes will include protective coatings for steel, concrete durability, maintenance of traffic flow and the use of composites for reinforcement and protection of concrete, landscaping, and erosion control.

- R&T is currently broadening the resources available to the department for research and forensic studies by developing partnerships with other research institutions, such as the URI Transportation Center (URITC), Brown University. This will allow RIDOT to tap a greater range of expertise and respond more rapidly to technical issues as they arise.

- R&T is participating in a Pooled Fund for Pavement Preservation through AASHTO RAC

- R&T is in discussion with the North East States and New York Department of Transportation to enter into joint research on issues of common interest in Pavement Preservation through the Pooled Fund Program.

<u>Accomplishments</u>

- *Research Administration (Task SPR 2(29) 2200):* The administration of the research effort includes the review of research issues, project management of all contracted and in house research projects including pooled fund studies, fiscal management, and activities as described herein.

- *TRB, under Task 2(29) 2201:* RIDOT is a contributing member of the TRB and receives research publications and technical bulletins for review and distribution. Also, hold active membership in two TRB subcommittees.

- *NCHRP:* As contributing members of NCHRP, we process and review proposals for pooled research and are participating in new research projects via research panel membership. The R&T Managing Engineer participates as a member of the AASHTO SCOR.

- *Peer Exchange:* RIDOT has completed its exchange process for this recent fiscal year.

Involvement:

- *NETC:* NETC is a consortium of the six New England states created for the purpose of pooling their academic, professional, and financial resources in dealing with research and development issues. R&T has membership on the Advisory Committee and coordinates local activity within the state (URI).

- *NTPEP, under Task 2(29) 2201:* Rhode Island is a member on 3 panels; joint sealers, rapid setting concrete patch materials and geotextiles.

- *AASHTO S.O.M.:* R&T participates in the AASHTO S.O.M. Mr. Franco is the chairman of Tech Section 4d (Safety Devices) as well as a member of other tech sections.

- *AASHTO RAC:* Mr. Manning attends the annual meeting of the RAC

- *AASHTO S.C.O.R:* Mr. Franco is the regional representative for AASHTO Region One on S.C.O.R.

- *Pavement Preservation E.T.G.*: Mr. Franco is a member of the E.T.G.

- *Peer Exchange:* Mr. Franco was on the team for the Turner-Fairbank Coating Laboratory.

Expenditure/Policy Notes:

- Funds have been set aside for RIDOT Research Advisory Committee Members to attend the Annual Transportation Research Board meeting in Washington, D.C. Exposure to the concepts there will broaden the understanding of the committee members of the areas currently being explored in research.

- Funds will also be made available to pay for the costs for the technical monitors to participate in technical committees for such national organizations as ASTM and NCHRP.

- The status of a number of long-running projects and yet-to-be-finalized proposals will be examined and evaluated to determine whether there is sufficient value in continuing the process. If it is decided that there is not, the projects/proposals will be terminated. Proposals with significant intrinsic merit may be re-solicited.

II. Completed Projects

The projects listed below have been completed, FHWA has approved the final report, copies of which have been distributed to all interested parties:

2215 - Behavior of Pot Bearings on Highway Bridges (URI)

2217 - Seasonal Variation of Soil Resilient Modulus for Rhode Island (URI)

2219 - Feasibility of Predicting the Fatigue Life of Steel Bridges Using a Fatigue Fuse (URI)

2220 - Estimation of Layer Coefficients for the Design of Flexible Pavement Facilities in Rhode Island (URI)

2221 - Monitoring Long Term Creep and Temperature Behavior of the Jamestown-Verrazzano Bridge (URI - Tsiatas)

2222 - The Effectiveness of Penetrant-Class Concrete Surface Sealers in Protecting Concrete Structures from Freeze-Thaw Deterioration (RIDOT)

2223 - Characterization of Roadway Runoff (URI)

2224 - The Viable Use of Crumb Rubber for Highway Construction in Rhode Island (URI)

2225 - Assessment of Water Pollutants from Asphalt Pavement Containing Recycled Rubber (URI)

2226 - Fatigue Strength of Deteriorated and Previously Stressed Highway Bridges (URI - Tsiatas)

2227 - Development of Design Parameters for Pavement Structures in Rhode Island (URI - Lee)

2228 - Expansion Joint Elimination For Steel Highway Bridges (URI - Tsiatas)

2229 - Determination of Chloride Permeability of Concrete by Total Chloride Analyses (RIDOT)

2232 - Independent Assurance Variation Limits (URI - Wang)

2234 - Alternative Low Cost Retaining Walls (URI - Veyera)

2235 - Evaluation of Fatigue Cracking and Permanent Deformation Resisting Characteristics of Asphalt Binder (URI)

2236 - CADD-based Simulation of the Impact Between a Vehicle and a Roadside Feature (URI - Karamandilidis)

2240 - Low-Temperature Cracking Resistance Characteristics of Recycled Asphalt Pavement Binder (URI - Lee)

2243 - Processing and Characterization of Lightweight Concrete Using Cenospheres (URI)

2246 - Attenuation Of Roadway Runoff (URI)

2249 - Remote Bridge Monitoring – A Survey (URI)

2255 - Durability and Performance of Novel Concrete-Cenosphere Composites in Extreme Environments (URI)

2258 - A Design of Experimental Approach to Study the Display of Variable Message Signs (URI)

2263 - Effects of Road Marking Luminance Contrast on Driving Safety (URI - Wang)

The final draft report is being revised for the following projects:

2241 - Repair of Steel Reinforced Concrete Structures (URI – R. Brown)

2242 - Determination of Optimum Moisture Content (OMC) and Maximum Dry Density of Soils Through the Use of a SHRP Gyratory Compactor (RIDOT – Frament)

2251 - Development of Subsurface Exploration Database and the Use of GIS Capabilities to Display and Create Subsurface Maps and Data Profiles for RIDOT Facilities Design and Construction (URI – Veeger, Boothroyd, Hamidzada, Hermes & Murray)

2252 - Development of Soil Mix and Plant Materials for Washington Bridge #200 Reconstruction (URI – B. Maynard)

2265 - Evaluation of Aggregate Gradation and Master Ranges on Performance of Asphalt Mixes (URI – Lee and Shukla)

2266 - Failure Analysis of Breakaway Couplings on Light Poles (URI – R. Brown)

2269 - Effect of Dust in Asphalt Binder (RIDOT – Frament)

2273 - Enhancing Motorist Understanding of Variable Message Sign Messages (URI – Wang)

2277 - Liquefaction Potential of Inorganic and Organic Silts (URITC – Baxter & Veyera)

2285 - Testing Models of Asphalt System Modification Using Molecular Simulation (URI – Greenfield)

2287 - Employing Graphics to Aid Message Display on Dynamic Message Signs (URI – Wang)

III. On Going Projects

2237 - Determining Water Content of Fresh Concrete – SHRP Test Method Number 2027 (RIDOT – Difilippo)

2239 - Geosynthetics for Soft Shoulder Stabilization (URI – G. Veyera)

2245 - Investigation of the Strength of Concrete Composite Joint Strength Subjected to Corrosive Environments (URI – R. Brown)

2250 - A Study Of Stainless Steel Reinforcement To Replace Carbon Steel Reinforcement (URI – R. Brown)

2259 - Behavior of Modified Concrete Mixes Subjected to Dynamic Loading (RIDOT – Sock)

2260 - An Analysis of Cracking and Road Conditions in Rhode Island (RIDOT – Byrne)

2264 - Field Performance of Hydrodynamic Separator Units (URI- Thiem)

2267 - A Study of the Residual Properties and Structure of High Mast Poles (URI – R. Brown)

2268 - Analysis of Aggregate Aspect Ratio and Void Structure within Portland and Bituminous Cement Concrete Matrices by Use of a Neural Network (RIDOT – Byrne)

2270 - Harnessing the Power of Relational Databases (URI – Veeger, Hermes, Murray, Boothroyd & Hamidzada)

2271 - Effect of Binder Grade on the Performance of Rhode Island Hot Mix Asphalt (URI – Lee)

2272 – Fiber-Reinforced Lightweight Shotcrete for Repair of Concrete Structures (URI – Greenfield, Bose, R. Brown & Shukla)

2274 - Characterization of the Rate Constant of Pozzolan Available Alkalis (RIDOT – Foisey)

2275 - The Feasibility of Portable Digital Assistants (PDA) for On-Site Reference and Data Tracking in Highway Construction Projects (RIDOT – Xenophontos & Sock)

2276 - A Comparison Between Metalizing and Galvanizing for Corrosion Protection of Highway Structures (URI – R. Brown)

2278 - Trade-Off Between Cyclist Safety and Widths of Bicycle and Adjacent Parking Lanes (URI – Thomas)

2279 - Design of Existing Simple Span Bridges Made Continuous (URI - Tsiatas & Lee)

2284 - Determination of Interfacial Bond Behavior of Composite Concrete-Asphalt Pavement Systems (URI – Sadd)

2288 - Evaluation of Native Grasses for Highway Slope Stabilization and Salt Tolerance (URI – Nelson Brown & Maynard)

2289 - Assessment of Liquefaction Resistance of Rhode Island Silts using Shear Wave Velocity (URI – Baxter)

2291 - Modeling Molecular-Level Actions of Asphalt Modifiers (URI – Greenfield)

2292 - Relationship between the Liquefaction Potential of Silts and SPT Results (URI – Baxter)

IV. New Projects

The following problem statements have been accepted by the JRAC and RRAC and proposals are now being solicited from the principal investigator. The proposals will be forwarded to FHWA for approval upon acceptance by RIDOT.

2231 - Validation of SHRP Asphalt Specifications and Mix Designs and Innovations in Asphalt Pavement for Experiment SPS-9 (RIDOT), on-hold

2238 - Implementation and Evaluation of Strategic Highway Research Program (SHRP) Test Method Number 2030 – Improved Sampling and Testing for Chloride in Concrete (RIDOT – Bak)

2253 - Evaluation of Varying Asphalt Overlays Placed Over Simulations of Existing Structures Through the Use of a Pavement Analyzer (RIDOT – Frament)

2257 - A Comparison of the Performance of Various Surface Finishes for Steel Reinforcement in Concrete (URI – R. Brown & Lee), on-hold

2280 - Evaluation of the Ductility and Elastic Recovery of Asphalt Based Systems (RIDOT – Materials)

2281 - Evaluation of Off-the-Shelf Antifreeze Admixtures for Concrete (RIDOT – Materials)

2282 - Asphalt Binder Modified with Crumb Rubber from Tires (RIDOT Problem Statement)

2283 - Bond of Overlays (RIDOT Problem Statement)

2286 - Innovative Intersection Pavements for Longer Life and High Performance and Evaluation of Aggregate Gradation and Asphalt Mixture Performance (Phase II) (URI – Lee, Tsiatas, Thomas, & Park)

2290 - Utilization of a Simple Performance Test System to Develop a Performance-Based Asphalt Mix Design (URI – Lee & Park)

2293 – Development of Pavement Rehabilitation System for RIDOT (Rowan – Mehta) †

2294 – Determination of Theoretical Maximum Density of Asphalt Mix through the Application of Boyle's Law (RIDOT – Frament) †

2295 – Assessment of Vehicle-Induced Bridge Vibrations in Rhode Island (URI – Gindy) †

2296 – Synthesis and Evaluation of Self-Healing Concrete (URI – Bose) †

2297 – Implementation of Geo Info DB – A Digital Borehole Library for the State of Rhode Island (URI – Veeger) †

2298 – Integrating Graphics into Dynamic Message Signing to Ease the Slow-Down Effect (URI – Wang) †

2299 – Development of Salt-Tolerant Grasses for Roadside Use (URI – Nelson Brown) †

† Tentative

Note: A project to investigate the removal of pavement markings to comply with the MUTCD standard was proposed and accepted; however, the proper scope is beyond the resources of the department. A proposal will be submitted to NCHRP or as a pooled fund study.

V. The following projects have been withdrawn:

2230 - Coordination for the Implementation of the Strategic Highway Research Program

2233 - Chemical Quality and Characterization of Road Sand Sweepings

2244 - Ernest Street SUPERPAVE Evaluation

2247 - Reducing Traffic Delays Due To Maintenance And Portable Travel Time Methods Using Camera And Video Imaging Software

2248 - Use Of Composite Reinforcing Bars/Grids For Bridge Decks

2254 - Removal of Lead Paint

2256 - Use of Fiber-Reinforced Polymers to Reinforce Column-Cap Joints

2261 - Stretching Ability of Chip Seal Membranes

2262 - A New Coating Process to Avoid Lead Paint Removal from Structures

VI. Special Projects/Studies/Technology Transfer

This encompasses special studies, failure investigations, and problem resolution. Over the years we have noted a need for small-scale, fast track research projects and studies, as mentioned above, that could be undertaken by various entities (e.g., RIDOT staff, URI researchers, and consultants). These include studies and projects as follows:

A. Studies

1. Finished / Accomplished

- Solvent Study: Investigate asphalt extraction solvents that could replace 1,1,1 - Trichloroethane
- Latex Bridge Deck Study: Determine whether the improvement in durability is worth the added cost.
- Los Angeles Abrasion Study: Revise RIDOT aggregate specifications.
- Highway Assessment Project: Evaluate the condition of five year old highways/highway features.
- Modified Friction Course Project: Develop a more durable layer to replace open graded asphalt friction course.
- Investigations: Settlement problems on I-95 in Cranston and on the Route 1 ramp in Narragansett.
- Silica Fume Placement Demonstration Video: Placement of the silica fume overlay on the Green State Airport connector elevated roadway.
- Breakaway Couplings I (S01-1)
- Highway Lighting I (S01-2)
- Geotechnical Guidelines (URI) (S01-3)
- Asphalt Adhesion to Rock (URI – Bose) (S02-3)
- Dynamic Strength Characteristics of High Performance Concrete (URI – Shukla) (S02-4)
- Intelligent Traffic Anomaly (URI – Peckham) (S02-5)
- Innovative Asphalt Pavement (RIDOT) (S03-3)

- Travel Time Prediction (URI - Peckham) (S03-4)
- Cable Guardrail Study on Route 1 (RIDOT)

2. Studies Underway / New

- Elastomeric Mixes / Binders (RIDOT)
- Asphalt Adhesion to Rock-Influence of Temperature (URI - Bose) (S03-1)
- Pavement Preservation Monitoring (RIDOT) (S03-2)
- Developing Model Asphalt Systems Using Molecular Simulation (URI - Greenfield) (S04-1)
- Web-Based Relational Database Portal -Subsurface Geotechnical Data (URI – Veeger et aL) (S04-2)
- Effect of Mix Variability on Concrete Maturity Systems (RIDOT - Awad) (S04-3)
- Evaluation of the Pine Rotary Asphalt Wheel Tester (RIDOT - Frament) (S05-1)
- Assessment of Road and Bridge Data for the Development of an Automated Oversize/Overweight Vehicle Routing and Permitting System (URI - Gindy) (S06-1)

B. Proposed/Ongoing ***Studies for FY 07 (Funded under Task SPR 2(29)-2202):***

- Investigate the Use of Warm Asphalt Technology for Modified Asphalts
- Investigate the Use of Highly Modified Asphalts for Use in Bridge Plug Joints
- Cable Guardrail Study – Phase II (RIDOT – Research with assistance from Design and Construction)
- Feasibility of Studying the Effect Of Oil From Vehicles Collecting On Pavements During Dry Weather Periods On Skid Resistance (RIDOT – Petsching) (S07-1)
- Investigation Of Salt Contamination In Groundwater (S07-2) (RIDOT R&T)
- Evaluation of Bridge Structure Elements and Durability Mitigation (Continuation of FY 1999 study) (RIDOT – Lima & Sock)

C. With the explosion of new technologies and the need to fast-track into them, we see the following as needed areas of study:

- Concrete: To further study the durability of the High Performance Concrete (HPC) currently used with a view toward enhancing the same, with additives and admixtures. Self-consolidating concrete and UHPC will be investigated. A focus will be in issues related to cracking of HPC mixes.

- Fiber Reinforced Composites (FRC): An expert group with industry, URI, and RIDOT members may be formed to implement research findings. The FHWA research office is promoting the use of FRC to strengthen and protect highway structures. URI has teamed with Rutgers University to perform an Innovative Bridge Research Concepts project to look at a protective coating system based on an FRC. NETC is also doing a study on FRC elements.

- Bridge Coating Systems: A review of the viability of metalizing is due, especially considering that some RIDOT structures have had a metalized coating for as long as fifteen years, and appear to be performing exceedingly well. RIDOT is also in partnership with NEPCOAT to evaluate new and existing coating technologies. The department is funding a URI project comparing the characteristics of metalizing to galvanizing. RIDOT will also be considering a Pooled Fund study on single coat systems.

- Human Factors: We would like to focus attention in this area. A more positive, proactive approach to transportation systems design would allow RIDOT to engineer highways and bridges more in keeping with the character of the culture and character of the state, rather than wait for feedback from the public after the engineering work has been done. URI is performing a series RIDOT-sponsored on the effectiveness of dynamic message signs.

- Intelligent Transportation Systems (ITS): This is a hot topic, with technological advances occurring at a very rapid pace. There is interest in the department (especially from the Traffic Management Center) in evaluating the new technologies for implementation in the highway system.

- Asphalt Repair and Rehabilitation Treatments: The RIDOT Asphalt Group is looking into crack sealing, chip sealing, slurry sealing and whitetopping, etc. in view of the fact that the RIDOT is looking into ways of making the best use of our financial resources. RIDOT is currently using many of these techniques and is constantly investigating new ones.

- Modified Asphalt: The RIDOT, in cooperation with the Hudson Companies and UMass Dartmouth, is investigating the crumb rubber modification of asphalt cement using a process developed at the FHWA's Turner-Fairbank Highway Research Center. A pooled fund project with the New England states has been created to look at modified asphalts. Asphalts modified with the process have been used on several crack seal and surface seal projects.

- Integration and Digitization of Data Collection and Tracking Systems: Most data collected in the field is ultimately stored electronically, although much of it is originally recorded by hand. Initiatives in the Department in recent years have increased digitization of data generated in offices and the next phase would be to extend this to field offices. The current PDA project is a step in this direction. As the technology becomes less expensive and more prevalent, the conversion from paper data entry to electronic will continue and a flexible plan should be in place to prevent a haphazard array of systems.

- R&T is in the process of constructing a Web site to provide information on its various activities, including all of the research efforts. There will be links to the available research project reports. The site will be part of the RIDOT main site and be linked from there. It is expected to come on-line within the next few months.

VII.

Appendices

Table 1: SPR 2(29), PART II FISCAL YEAR 2007
RESEARCH ADMINISTRATION, STUDIES AND POOLED FUNDS - ACCOUNT STATUS AS OF 6/30/06

PROJECT TYPE	DESCRIPTION	PROJECT AMOUNT FY 06	EST. EXPENDITURES AS OF 6/30/06	ESTIMATED COST FY 07
ADMIN	R&T PERSONNEL SERVICES I	$35,000	$55,000	$60,000
ADMIN	PERSONNEL SERVICES II (PROJ. TECHNICAL & PROGRAM MONITORS)	$26,000	$23,000	$24,000
ADMIN	CONTINGENCY	$75,000	$4,500	$75,000
ADMIN	TRAVEL (AASHTO RAC/SOM, NESMEA, NTPEP, PEER EXCHANGE, TRB)	$10,000	$9,500	$10,000
ADMIN	CAPITAL COST – GENERAL	$900	$600	$2,300
	TOTAL ADMINISTRATION [SPR-2(29)-2200] :	*$146,900*	*$92,600*	*$171,300*
POOLED FUND	NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP)	$167,111	$167,111	$167,111
POOLED FUND	NEW ENGLAND TRANSPORTATION CONSORTIUM (NETC)	$100,000	$100,000	$105,000
POOLED FUND	NATN'L TRANS. PRODUCT EVAL'N. PROGRAM (NTPEP) * SPR-2(29)2201	$6,000	$6,000	$6,000
POOLED FUND	TRANSPORTATION RESEARCH BOARD (TRB) * SPR-2(29)2201	$64,635	$64,635	$75,090
POOLED FUND	TRAFFIC MANAGEMENT CENTER CONSORTIUM	$15,000	$15,000	$0
POOLED FUND	GUIDELINES DEVELOPMENT FOR SELECTION OF CRACK SEALANTS	$20,000	$20,000	$0
POOLED FUND	COORDINATION OF PAVEMENT ACTIVITIES IN THE NORTHEAST	$5,000	$5,000	$6,000
POOLED FUND	PERFORMANCE GRADE BINDERS	$30,000	$30,000	$30,000
POOLED FUND	TRANSPORTATION SYSTEM PRESERVATION (TSP)2	$6,000	$6,000	$6,000
	TOTAL POOLED FUNDS: [SPR-2(29)-2201]	*$413,746*	*$413,746*	*$395,201*
STUDY-99-3	HIGHWAY ASSESSMENT, STUDY OF TEN YEAR OLD PROJECTS	$4,900	$5,055	$0
STUDY-00-1	EVAL'N. OF SUBSTRUCTURE ELEMENTS BY IMPACT ECHO LOCATION	$35,000	$23,800	$11,200
STUDY-00-2	EVAL'N. OF EXISTING STEEL REINFORCEMENT IN OLDER STRUCTURES	$6,000	$0	$3,500
STUDY-01-3	GEOTECHNICAL GUIDELINES	$26,099	$26,099	$0
STUDY-02-5	INTELLIGENT TRAFFIC ANOMALY	$23,609	$23,609	$0
STUDY-03-1	ASPHALT ADHESION TO ROCK-INFLUENCE OF TEMPERATURE	$42,852	$0	$42,852
STUDY-03-2	PAVEMENT PRESERVATION MONITORING	$10,000	$0	$10,000
STUDY-04-1	DEV. MODEL ASPHALT SYSTEMS USING MOLECULAR SIMULATION	$35,307	$21,000	$35,307
STUDY-04-2	WEB-BASED REL. DATABASE PORTAL -SUBSURFACE GEOTECH DATA	$47,787	$14,110	$47,787
STUDY-04-3	EFFECT OF MIX VARIABILITY ON CONCRETE MATURITY SYSTEMS	$7,183	$2,495	$4,688
STUDY-05-1	EVALUATION OF THE PINE ROTARY ASPHALT WHEEL TESTER	$9,000	$2,100	$6,900
STUDY-06-1	ASSESSMENT OF RD & BRIDGE DATA FOR THE DEV OF AN AUTOMATED OVERSIZE/OVERWEIGHT VEHICLE ROUTING & PERMITTING SYSTEM	$0	$0	$12,518
STUDY-07-1	EFFECT OF OIL FROM VEHICLES COLLECTING ON PAVEMENTS DURING DRY WEATHER PERIODS ON SKID RESISTANCE	*$8,000*	*$0*	*$8,000*
STUDY-07-2	INVESTIGATION OF SALT CONTAMINATION IN GROUNDWATER	*$10,000*	*0*	*$10,000*
TOTAL: STUDIES [SPR-2(29)-2202]		*$265,737*	*$118,268*	*$192,752*
TOTAL		***$816,383***	***$624,614***	***$759,253***

Notes:
1] The Capital Costs through 6/30/06 include expenditures for the forensic studies
2] The contingency costs are estimates that carry over; the balance of funds not expended carry over.
3] Travel to TRB includes costs for RIDOT Research Advisory Committee members.

Table 2: SPR 2(29)2200, PART II FISCAL YEAR 2007
ADMINISTRATION PERSONNEL COSTS

Personnel	Names	2200/ Admin.	2200/ T. Mon.	2202/ Projects	2259	2275	P.E.	CONST.	ADM	TOTAL DAYS
Managing Engineer	C. Franco	80		5					145	230
Pr. Civil Engineer	D. Munroe	35					70	125		230
Pr. Civil Engineer	F. Manning	40	10	5			65	110		230
Sr. Civil Engineer	M. Sock	85	5	10	55	10	45	20		230
Sr. Civil Engineer	J. Lima		10	20	15		135	50		230
Sr. Civil Engineer	M. Sherrill		10				155	65		230
Eng. Tech II	C. Corrente	10		10			75	135		230
Eng. Tech III	J. Grossi	5		10			95	120		230
TOTAL		***255***	***35***	***55***	***70***	***10***	***640***	***625***	***145***	***1,840***

Notes: 2200 Administrative- R&T Staff Days for Administration of Research Program
2200 Technical Monitors- R&T Staff Days for Monitoring Research Projects
2200 Project - R&T Staff Days for special/forensic studies
Depending on need, the summer interns may charge up to ten days (total)

Table 3A: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER ISTEA - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY 06	PROJECT STATUS	ESTIMATED COST FY 2007
2219	ME 501	FEASIBILITY of PREDICTING the FATIGUE LIFE of STEEL BRIDGES USING a FATIGUE FUSE	$88,750	$83,450	$0	COMPLETE	$0
2220	ME 527	ESTIMATION of LAYER COEFFICIENTS for the DESIGN of FLEXIBLE PAVEMENT FACILITIES in RHODE ISLAND	$186,750	$186,500	$0	COMPLETE	$0
2221	CA97045	MONITORING of LONG TERM CREEP and TEMPERATURE BEHAVIOR of the JAMESTOWN-VERRAZZANO BRIDGE	$60,478	$51,103	$0	COMPLETE	$0
2222	—	THE DURABILITY of PENETRANT-CLASS SEALER-COATED AIR-ENTRAINED CONCRETE SUBJECTED to FREEZE/THAW	$73,628	$67,628	$0	COMPLETE	$0
2223	ME 257	CHARACTERIZATION of ROADWAY RUNOFF PRIOR to TREATMENT	$89,819	$89,819	$0	COMPLETE	$0
2224	ME 217	The VIABLE USE of CRUMB RUBBER for HIGHWAY CONSTRUCTION in RHODE ISLAND	$157,950	$156,845	$0	COMPLETE	$0
2225	CA97073	ASSESSMENT of WATER POLLUTANTS from ASPHALT PAVEMENT CONTAINING RECYCLED RUBBER	$74,100	$74,100	$0	COMPLETE	$0
2226	CA97066	FATIGUE STRENGTH of DETERIORATED and PREVIOUSLY STRESSED HIGHWAY BRIDGES	$51,491	$51,491	$0	COMPLETE	$0
2227	CA97065	DEVELOPMENT of DESIGN PARAMETERS for PAVEMENT STRUCTURES in RHODE ISLAND	$74,828	$74,828	$0	COMPLETE	$0
2228	CA97064	EXPANSION JOINT ELIMINATION for STEEL HIGHWAY BRIDGES	$58,309	$58,309	$0	COMPLETE	$0
2229	----	DETERMINATION of CHLORIDE PERMEABILITY of CONCRETE by TOTAL CHLORIDE ANALYSES	$42,431	$45,673	$0	COMPLETE	$0
2232	5420632	INDEPENDENT ASSURANCE VARIATION LIMITS	$37,000	$32,791	$0	COMPLETE	$0

Table 3A: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER ISTEA - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY 06	PROJECT STATUS	ESTIMATED COST FY 2007
2234	5420534	ALTERNATIVE LOW COST RETAINING WALLS	$71,479	$71,479	$0	COMPLETE	$0
2235	CA96072	EVALUATION of FATIGUE CRACKING and PERMANENT DEFORMATION RESISTING CHARACTERISTICS of ASPHALT BINDER	$74,836	$74,836	$0	COMPLETE	$0
2236	CA96036	CADD-BASED SIMULATION of the IMPACT BETWEEN a VEHICLE and a ROADSIDE FEATURE	$37,086	$37,086	$0	TERMINATED	$0
TOTAL			***$1,178,935***	***$1,155,938***	***$0***	***-***	***$0***

Table 3B: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER TEA-21 - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY 06	PROJECT STATUS	ESTIMATED COST FY 2007
2237	----	DETERMINING WATER CONTENT of FRESH CONCRETE - SHRP TEST METHOD NUMBER 2027	$8,838	$0	$0	ACTIVE	$8,838
2238	----	IMPLEMENTATION and EVALUATION of SHRP TEST METHOD 2030 - IMPROVED SAMPLING and TESTING for CHLORIDE in CONCRETE	$29,150	$0	$0	PENDING	$0
2239	5420639	GEOSYNTHETICS for SOFT SHOULDER STABILIZATION	$75,000	$31,416	$0	ACTIVE	$43.584
2240	5420540	LOW-TEMPERATURE CRACKING RESISTANCE CHARACTERISTICS of RECYCLED ASPHALT PAVEMENT BINDER	$74,940	$74,940	$0	COMPLETE	$0
2241	5420541	REPAIR of STEEL REINFORCED CONCRETE STRUCTURES	$61,977	$60,000	$0	DRAFT REPORT	$1,977
2242	----	SHRP GYRATORY SOIL COMPACTION	$64,500	$39,831	$0	DRAFT REPORT	$24,669
2243	5420643	PROCESSING and CHARACTERIZATION of a LIGHTWEIGHT CONCRETE USING CENOSPHERES	$74,827	$74,827	$0	COMPLETE	$0
2245	5420645	INVESTIGATION of the STRENGTH of CONCRETE COMPOSITE JOINT STRENGTH SUBJECTED to CORROSIVE ENVIRONMENTS	$79,201	$35,000	$0	ACTIVE	$44,201
2246	5420646	ATTENUATION of ROADWAY RUNOFF	$82,361	$82,361	$0	COMPLETE	$0
2249	5420749	BRIDGE INSTRUMENTATION and REMOTE MONITORING	$44,969	$44,969	$0	COMPLETE	$0
2250	5420650	A STUDY of STAINLESS STEEL REINFORCEMENT to REPLACE CARBON STEEL REINFORCE'T.	$74,999	$50,000	$0	ACTIVE	$24,999

Table 3B: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER TEA-21 - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY 06	PROJECT STATUS	ESTIMATED COST FY 2007
2251	54200651	DEVELOPMENT of SUBSURFACE EXPLORATION DATABASE & the USE of GIS CAPABILITIES to DISPLAY & CREATE SUBSURFACE MAPS & DATA PROFILES for RIDOT FACILITIES DESIGN & CONSTRUCTION	$100,094	$90,000	$0	DRAFT REPORT	$10,094
2252	2282252	DEVELOPMENT of SOIL MIX & PLANT MATERIALS for WASHINGTON BRIDGE #200 RECONSTRUCTION	$40,085	$30,000	$0	DRAFT REPORT	$10,085
2253	----	EVALUATION of VARYING ASPHALT OVERLAYS PLACED OVER SIMULATIONS of EXISTING STRUCTURES THROUGH the USE of a PAVEMENT ANALYZER	$107,000	$0	$0	PENDING	$0
2255	5430655	DURABILITY & PERFORMANCE of NOVEL CONCRETE-CENOSPHERE COMPOSITES in EXTREME ENVIRONMENTS	$75,000	$75,000	$0	COMPLETE	$0
2257	----	A COMPARISON of the PERFORMANCE of VARIOUS SURFACE FINISHES for STEEL REINFORCEMENT in CONCRETE	$66,970	$0	$0	ON HOLD	$0
2258	5430658	A DESIGN of EXPERIMENTAL APPROACH to STUDY the DISPLAY of VARIABLE MESSAGE SIGNS	$46,491	$46,491	$0	COMPLETE	$0
2259	----	BEHAVIOR of MODIFIED CONCRETE MIXES SUBJECTED to DYNAMIC LOADING	$142,809	$137,351	$0	ACTIVE	$5,458
2260	----	AN ANALYSIS of CRACKING and ROAD CONDITIONS in RHODE ISLAND	$99,503	$80,000	$0	ACTIVE	$19,503
2261	2272261	STRETCHING ABILITY of CHIP SEAL MEMBRANES	$1,259	$1,259	$0	TERMINATED	$0
2263	5420763	EFFECTS of ROAD MARKING LUMINANCE CONTRAST on DRIVING SAFETY	$62,689	$62,689	$0	COMPLETE	$0
2264	2272264	FIELD PERFORMANCE of HYDRODYNAMIC SEPARATOR UNITS	$77,250	$60,000	$60,000	ACTIVE	$17,250

Table 3B: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER TEA-21 - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY 06	PROJECT STATUS	ESTIMATED COST FY 2007
2265	2272265	EVALUATION of AGGREGATE GRADUATION & MASTER RANGES on PERFORMANCE of ASPHALT MIXTURES	$79,936	$74,936	$0	DRAFT REPORT	$5,000
2266	5420766	BREAKAWAY COUPLINGS – FAILURE ANALYSIS & LIFETIME PREDICTION – PROGRAM 1, TASK II	$80,000	$60,000	$0	DRAFT REPORT	$20,000
2267	5420767	HIGHWAY LIGHTING – FAILURE ANALYSIS & LIFETIME PREDICTION – PROGRAM 2, TASK II	$60,000	$40,000	$0	ACTIVE	$20,000
2268	----	ANALYSIS of AGGREGATE ASPECT RATIO & VOID STRUCTURE w/in PORTLAND & BITUMINOUS CEMENT CONCRETE MATRICES by use of a NEURAL NETWORK	$53,163	$17,449	$0	ACTIVE	$25,414
2269	----	EFFECT of DUST in ASPHALT BINDER	$58,250	$46,500	$0	DRAFT REPORT	$11,750
2270	2272270	HARNESSING the POWER of RELATIONAL DATABASES	$43,477	$43,467	$8,212	ACTIVE	$10
2271	2282271	EFFECT of BINDER on the PERFORMANCE of RHODE ISLAND HOT MIX ASPHALT	$122,699	$0	$0	ACTIVE	$80,000
2272	2282272	FIBER-REINFORCED LIGHTWEIGHT SHOTCRETE for PATCHING and RETROFITTING of CONCRETE STRUCTURES	$120,001	$80,000	$80,000	ACTIVE	$40,001
2273	2272273	ENHANCING MOTORIST UNDERSTANDING of VARIABLE MESSAGE SIGN MESSAGES	$49,750	$40,000	$0	DRAFT REPORT	$9,750
TOTAL			***$2,157,188***	***$1,478,486***	***$148,212***	**-**	***$422,583***

Table 3C: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER SAFETEA - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY06	PROJECT STATUS	ESTIMATED COST FY 2007
2274	----	CHARACTERIZATION of the RATE CONSTANT of POZZOLAN AVAILABLE ALKALIS	$61,000	$21,550	$0	ACTIVE	$39,450
2275	----	THE FEASIBILITY OF PDA's for ON-SITE REFERENCE and DATA TRACKING in HIGHWAY CONSTRUCTION PROJECTS	$35,447	$12,289	$0	ACTIVE	$23,158
2276	2282276	A COMPARISON BETWEEN METALIZING and GALVANIZING for CORROSION PROTECTION of HIGHWAY STRUCTURES	$103,111	$0	$0	ACTIVE	$40,000
2277	2282277	LIQUEFACTION POTENTIAL of INORGANIC and ORGANIC SILTS	$66,374	$58,930	$58,930	DRAFT REPORT	$7,444
2278	2282278	TRADE-OFF BETWEEN CYCLIST SAFETY, BICYCLE LANE SELECTION, and WIDTHS of BICYCLE and ADJACENT PARKING LANES	$75,000	$20,000	$0	ACTIVE	$55,000
2279	2282279	DESIGN of EXISTING SIMPLE SPAN BRIDGES MADE CONTINUOUS	$75,120	$0	$0	ACTIVE	$50,000
2280	----	EVALUATION of the DUCTILITY and ELASTIC RECOVERY of ASPHALT BASED SYSTEMS	$23,000	$0	$0	PENDING	$18,000
2281	----	EVALUATION of OFF-the-SHELF ANTIFREEZE ADMIXTURES for CONCRETE	$20,000	$0	$0	PENDING	$10,000
2282		ASPHALT BINDER MODIFIED WITH CRUMB RUBBER FROM TIRES	$60,000	$0	$0	PENDING	$15,000

Table 3C: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER SAFETEA - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY06	PROJECT STATUS	ESTIMATED COST FY 2007
2283		BOND of OVERLAYS	$50,000	$0	$0	PENDING	$12,000
2284	2292284	DETERMINATION of INTERFACIAL BOND BEHAVIOR of COMPOSITE CONCRETE-ASPHALT PAVEMENT SYSTEMS	$74,982	$0	$0	ACTIVE	$45,000
2285	2292285	TESTING MODEL ASPHALT SYSTEM MODIFICATION USING MOLECULAR SIMULATION	$27,560	$21,710	$21,710	DRAFT REPORT	$5,850
2286		INNOVATIVE INTERSECTION PAVEMENTS for LONGER LIFE & HIGH PERFORMANCE & EVALUATION of AGGREGATE GRADATION & ASPHALT MIXTURE PERFORMANCE (P II)	$87,000	$0	$0	PENDING	$28,000
2287	2292287	EMPLOYING GRAPHICS to AID MESSAGE DISPLAY on DYNAMIC MESSAGE SIGNS	$16,971	$15,535	$3,364	DRAFT REPORT	$1,436
2288	2292288	EVALUATION of NATIVE GRASSES for HIGHWAY SLOPE STABILIZATION and SALT TOLERANCE	$68,606	$0	$0	ACTIVE	$25,500
2289	2292289	ASSESSMENT of LIQUEFACTION RESISTANCE of RHODE ISLAND SILTS using SHEAR WAVE VELOCITY	$66,036	$0	$0	ACTIVE	$38,000
2290		UTILIZATION of a SIMPLE PERFORMANCE TEST SYSTEM to DEVELOP a PERFORMANCE-BASED ASPHALT MIX DESIGN	$75,000	$0	$0	PENDING	$0
2291	2292291	MODELING MOLECULAR-LEVEL ACTIONS of ASPHALT MODIFIERS	$80,000	$0	$0	ACTIVE	$30,000

Table 3C: PART II FISCAL YEAR 2007

RESEARCH PROJECTS UNDER SAFETEA - ACCOUNT STATUS AS OF 6/30/06 PART II

PROJECT #	CONTRACT #	PROJECT DESCRIPTION	PROJECT AMOUNT	CUMULATIVE EXPENDITURES AS OF 6/30/06	EXPENDITURES FY06	PROJECT STATUS	ESTIMATED COST FY 2007
2292	2292292	RELATIONSHIP between the LIQUEFACTION POTENTIAL of SILTS and SPT RESULTS	$42,075	$0	$0	ACTIVE	$28,400
2293		DEVELOPMENT of PAVEMENT REHABILITATION SYSTEM for RIDOT	$40,000	$0	$0	PENDING	$0
2294		DETERMINATION OF THEORETICAL MAXIMUM DENSITY OF ASPHALT MIX THROUGH THE APPLICATION OF BOYLE'S LAW	$5,000	$0	$0	PENDING	$5,000
2295		ASSESSMENT of VEHICLE-INDUCED BRIDGE VIBRATIONS in RHODE ISLAND	$85,000	$0	$0	PENDING	$0
2296		SYNTHESIS and EVALUATION of SELF-HEALING CONCRETE	$65,000	$0	$0	PENDING	$0
2297		IMPLEMENTATION of GEO INFO DB – A DIGITAL BOREHOLE LIBRARY for the STATE of RHODE ISLAND	$38,000	$0	$0	PENDING	$0
2298		INTEGRATING GRAPHICS into DYNAMIC MESSAGE SIGNING to EASE the SLOW-DOWN EFFECT	$56,000	$0	$0	PENDING	$0
2299		DEVELOPMENT of SALT-TOLERANT GRASSES for ROADSIDE USE	$73,000	$0	$0	PENDING	$0
TOTAL			***$1,469282***	***$150,014***	***$84,004***	**-**	***$477,238***

Table 4: ESTIMATED FINANCING SUMMARY SHEET
SPR-2(29)

A.	Availability of Funds			
FFY'07	Federal Funds	Federal Matching Rate	State Match	Total
SPR-Part II	$759,596			
Less Pooled Funds:				
NCHRP	($167,111)	100%		
NETC	($105,000)	100%		
Pavement Coordination	($6,000)	100%		
Performance Grade Binders	($30,000)	100%		
Trans. Sys. Pres. (TSP)2	($6,000)	100%		
Total FY 2007	*$445,485*	*80%*	*$111,371*	***$556,856***

B.	Estimated Financing SPR-2(29) FY 07			
	Federal Funds	Federal Matching Rate	State Match for Eligible Funds	Total
Total FY 2007	*$759,596*	*80%*	*$111,371*	***$870,967***

The federal funds given here are based on FY05 appropriation. The state contribution is for the amount eligible for matching after the 100% federally funded have been subtracted from the 25% (for SPR, Part II) of the 2% (for the total SPR) of the federal appropriation. The additional funds that will be required to pay for ongoing research projects will be paid for by funds originally set aside for that purpose and carried over from the year in which those funds were authorized (as shown in Table 5).

Notes:

1] The total estimated cost for FY07is $*1,648,206*. This is from Tables 1and 3 (Parts A, B & C). Funding for this includes money from previous fiscal years that were committed but have not as yet been expended.
2] Section A shows the amount free after paying for the mandatory programs
3] Section B is the total finances estimated from the mandatory fund for SPR Part II

Table 5: RESEARCH FUNDING COMMITMENTS UNDER ISTEA PROGRAM

	7/91-6/92 FY 92	7/92-6/93 FY 93	7/93-6/94 FY 94	7/94-6/95 FY 95	7/95-6/96 FY 96	7/96-6/97 FY 97
IA Pooled Funds:						
NCHRP	$104,702	$117,584	$116,685	$112,474	$77,919	$82,163
NETC	$70,000	$70,000	$70,000	$75,000	$75,000	$75,000
NETTCP	----------	----------	----------	----------	---------	$13,629
SHRP (GIS)	$197,500	$197,500	----------	----------	---------	---------
IA Total	*$372,202*	*$385,084*	*$186,685*	*$187,474*	*$152,919*	*$170,792*
IB Mandated Funds:						
TRB	$37,555	$37,555	$37,555	$47,010	$47,010	$47,010
NTPEP	----------	----------	----------	$4,500	$4,500	$4,500
IB Total	*$37,555*	*$37,555*	*$37,555*	*$51,510*	*$51,510*	*$51,510*
II Administration Total	*$27,070*	*$33,658*	*$55,081*	*$58,004*	*$29,879*	*$48,858*
IIIA URI Projects						
2219	$83,450					
2220	$186,500					
2221			$51,103			
2223			$89,819			
2224			$156,845			
2225				$74,100		
2226				$51,491		
2227				$74,828		
2228				$58,309		
2234					$71,479	
2235					$74,836	
2236					$37,086	
IIIA Total	*$269,950*	*$0*	*$297,767*	*$258,728*	*$183,401*	*$0*
IIIB. RIDOT Projects						
2222			$73,628			
2229				$42,431		
2232					$32,7981	
IIIB Total	*$0*	*$0*	*$ 73,624*	*$42,431*	*$32,791*	*$0*
Total Expenses	***$706,777***	***$456,297***	***$650,716***	***$598,147***	***$450,500***	***$271,160***
INCOME						
SPR Fed. Funds (25%) (a)	$475,922	$534,474	$530,386	$511,246	$354,179	$373,470
Pooled Funds (b)	$372,202	$385,084	$186,685	$187,474	$152,919	$170,792
(a) - (b) (c)	$103,720	$149,390	$343,701	$323,772	$201,260	$202,678
125%(c) (d)	$129,650	$186,738	$429,626	$404,715	$251,575	$253,348
(b) + (d) Total Income	*$501,852*	*$571,822*	*$616,311*	*$592,189*	*$404,494*	*$424,140*
Income minus **Expenses**	**($210,475)**	**$115,525**	**($35,506)**	**($5,958)**	**($53,404)**	**$152,980**
Total Income for ISTEA: Total Expenditures/Commitments						***($36,839)***

Note: 1] Total Expenses = IA Total + IB Total + II Total + IIIA Total + IIIB Total
2] Recalculation of the expenditures has shown that the funds committed during ISTEA were in excess of the funds received for SPR Part II. However, as many of the projects have not been completed and the full monies not disbursed, we have not exceeded our spending limits. We will request the use of TEA-21 funds to make up the shortfall, if any

Table 6: RESEARCH FUNDING COMMITMENTS
UNDER TEA-21 PROGRAM FY98-03

	7/97-6/98 FY 98	7/98-6/99 FY 99	7/99-6/00 FY 00	7/00-6/01 FY 01	7/01-6/02 FY 02	7/02– 6/03 FY 03
IA. Pooled Funds:						
NCHRP	$143,212	$166,686	$178,656	$188,760	$193,705	$170,878
NETC	$131,000	$75,000	$100,000	$100,000	$100,000	$100,000
NECEPT			$7,507	$4,500		
HERMES II				$50,000		
TMC				$15,000	$15,000	
NCAT OGFC				$20,000		
Crack Sealants						$20,000
Pavement Coordination						$5,000
IA. Total	*$274,212*	*$241,686*	*$286,163*	*$378,260*	*$308,705*	*$295,878*
IB. Mandated Funds:						
TRB	$49,975	$49,975	$49,975	$60,330	$60,330	$60,330
NTPEP	$4,500	$4,500	$4,500	$4,500	$4,500	$4,500
IB. Total	*$54,475*	*$54,475*	*$54,475*	*$64,830*	*$64,830*	*$64,830*
IIA. Administration Total	*$53,619*	*$63,506*	*$106,958*	*$107,000*	*$79,700*	*$76,009*
IIB. Studies Total				*$96,019*	*$68,228*	*$191,510*
IIIA. URI Projects						
2 (26) –2239	$75,000					
2 (26) – 2240	$74,940					
2 (26) – 2241	$61,977					
2 (26) – 2243			$74,827			
2 (26) – 2245			$79,201			
2 (26) – 2246			$82,361			
2 (26) – 2249			$44,969			
2 (26) – 2250			$74,999			
2 (26) - 2251				$100,094		
2 (26) - 2252				$40,085		
2 (26) – 2255				$75,000		
2 (26) – 2257				$66,970		
2 (26) – 2258				$46,491		
2 (27) - 2261					$1,259	
2 (27) – 2263					$62,689	
2 (27) – 2264					$77,250	
2 (27) – 2265					$79,936	
2 (27) – 2266					$80,000	
2 (27) – 2267					$60,000	
2 (27) – 2270						$43,477
2 (27) – 2271						$122,699
2 (27) – 2272						$120,001
2 (27) – 2273						$49,750
IIIA. Total	*$211,917*	*$0*	*$356,357*	*$328,640*	*$361,134*	*$335,927*
IIIB. RIDOT Projects						
2 (26) – 2237	$8,838					
2 (26) – 2238	$29,150					

Table 6: RESEARCH FUNDING COMMITMENTS
UNDER TEA-21 PROGRAM FY98-03

2 (26) – 2242				$64,500			
2 (26) – 2253					$107,000		
2 (27) – 2259						$142,809	
2 (27) – 2260						$99,503	
2 (27) – 2268							$53,163
2 (27) – 2269							$58,250
IIIB. Total		*$37,988*	*$0*	*$64,500*	*$107,000*	*$242,312*	*$111,413*
Total Expenses		***$632,211***	***$359,667***	***$868,453***	***$1,081,749***	***$1,12,909***	***$1,075,567***
INCOME							
SPR Fed. Funds (25%)	(a)	$650,966	$757,663	$812,074	$858,000	$858,000	$776,719
Pooled Funds	(b)	$274,212	$241,686	$286,163	$378,260	$308,705	$295,878
(a) - (b)	(c)	$376,754	$515,977	$525,911	$479,740	$549,295	$480,841
125%(c)	(d)	$470,943	$644,971	$657,389	$599,675	$686,619	$601,051
(b) + (d) Total Income		*$745,155*	*$886,657*	*$943,552*	*$977,935*	*$995,324*	*$896,929*
Income minus **expenses**		**$112,944**	**$526,990**	**$75,099**	**($103,814)**	**($129,585)**	**($178,638)**
Total Income for TEA-21: Total Expenditures/Commitments							***$302.996***

Note: 1] Total Expenses = IA Total + IB Total + IIA Total + IIB Total + IIIA Total + IIIB Total
2] In FY 98, $56,000 in SPR funds was provided through NETC to purchase dynamic shear rheometers for the six New England states' materials testing sections.

Table 7: RESEARCH FUNDING COMMITMENTS
UNDER SAFETEA PROGRAM FY04-09

	7/03-6/04 FY 04	7/04-6/05 FY 05	7/05-6/06 FY 06	7/06-6/07 FY 07	7/07-6/08 FY 08	7/08– 6/09 FY 09
IA Pooled Funds:						
NCHRP	$203,659	$168,260	$167,111	$167,111		
NETC	$124,000	$100,000	$105,000	$105,000		
TMC	$15,000	$15,000	$15,000	-	-	-
Crack Sealants	$20,000	$20,000	$20,000	-	-	-
Pavement Coordination	-	$5,000	$5,000	$6,000		
Performance Grade Binders	-	-	$30,000	$30,000		
Trans. Sys. Pres. (TSP)2	-	-	$6,000	$6,000	-	-
IA. Total	*$362,659*	*$308,260*	*$348,111*	*$314,111*		
IB. Mandated Funds:						
TRB	$64,635	$64,635	$64,635	$75,090		
NTPEP	$4,500	$6,000	$6,000	$6,000		
IB. Total	*$69,135*	*$70,635*	*$70,635*	*$81,090*		
IIA. Administration Total	*$85,000*	*$100,000*	*$100,000*	*$100,000*		
IIB. Studies Total	*$70,307*	*$13,688*	*$12,518*	*$18,000*		
IIIA. URI Projects						
2 (28) –2276	$103,111					
2 (28) – 2277	$66,374					
2 (28) – 2278	$75,000					
2 (28) – 2279	$75,120					
2 (28) – 2282		$60,000				
2 (28) – 2283		$50,000				
2 (28) – 2284		$74,982				
2 (28) – 2285		$27,560				
2 (28) – 2286		$87,000				
2 (28) – 2287		$16,971				
2 (29) – 2288			$68,606			
2 (29) – 2289			$66,036			
2 (29) – 2290			$75,000			
2 (29) – 2291			$80,000			
2 (29) – 2292			$42,075			
2 (29) – 2295				$85,000		
2 (29) – 2296				$65,000		
2 (29) – 2297				$38,000		
2 (29) – 2298				$56,000		
2 (29) – 2299				$73,000		
IIIA. Total	*$319,605*	*$316,513*	*$331,717*	*$317,000*		
IIIB. RIDOT Projects						
2 (28) – 2274	$61,000					
2 (28) – 2275	$35,447					
2 (28) – 2280		$23,000				

2 (28) – 2281			$20,000			
2 (29) – 2293					$40,000	
2 (29) – 2294					$5,000	
IIIB. Total		*$96,447*	*$43,000*		*$45,000*	
Total Expenses		***$1,003,153***	***$852,096***	***$862,981***	***$875,200***	
INCOME						
SPR Fed. Funds (25%)	(a)	$925,722	$764,820	$759,596	$759,596	
Pooled Funds	(b)	$362,659	$308,260	$348,111	$314,111	
(a) - (b)	(c)	$563,063	$456,560	$411,485	$445,485	
125%(c)	(d)	$703,829	$570,700	$514,356	$556,856	
(b) + (d) Total Income		*$1,066,488*	*$878,960*	*$862,467*	*$870,967*	
Income minus **expenses**		**$63,335**	**$26,864**	**($514)**	**($4,233)**	

Total Income for SAFETEA: Total Expenditures/Commitments ***$85,453***

Capital Costs:

For the continuing Pavement Preservation Monitoring study, a camcorder with USB transfer capability will be required. The purchase will be charged to the funds allocated for that study (03-2). A digital still camera with an internal GPS unit will also be used to improve location data within the monitoring data. A plotter suitable for printing large scale location maps will be also be needed.

$6,000.

For the Impact Echo Location study, an upgrade for the instrument is needed. The current control system no longer functions and since it is obsolete, it must be replaced. A laptop will also be needed, as the current one is inadequate to run the new software. This will be covered in the funds for the study (00-1).

$5,000.

A laptop suitable for presentations will be needed. The current laptop purchased for that use is ten years old and cannot run current software effectively. A new projector will also be needed. The equipment will be used for various technology transfer activities. The purchase will be charged to general capital costs.

$2,300.

R&T Organization/Responsibilities Chart